

#### 4.4.2.7. Table Keywords

These keywords are used to describe the contents of ASCII table extensions (Sect. 7.2) or binary table extensions (Sect. 7.3). They are *optional*, but if they appear in the header describing an ASCII or binary table, they *must* be used as defined in this section of this standard. They *shall not* be used in headers describing other structures unless the meaning is the same as defined here.

The following 4 keywords *may* be used to describe the actual or allowed minimum and maximum values in numerical columns of a *FITS* ASCII or binary table. These keywords *must* have the same data type as the physical values in the associated column (either an integer or a floating point number). Any undefined elements in the column (or any other IEEE special values in the case of floating point columns in binary tables) *shall* be excluded when determining the value of these keywords.

**TDMINn Keyword.** The value field *shall* contain a number giving the minimum physical value actually contained in column n of the table. This keyword is analogous to the DATAMIN keyword that is defined for arrays in Sect. 4.4.2.5.

**TDMAXn Keyword.** The value field *shall* contain a number giving the maximum physical value actually contained in column n of the table. This keyword is analogous to the DATAMAX keyword that is defined for arrays in Sect. 4.4.2.5.

**TLMINn Keyword.** The value field *shall* contain a number giving the minimum legally defined physical value that may be contained in column n of the table.

**TLMAXn Keyword.** The value field *shall* contain a number giving the maximum legally defined physical value that may be contained in column n of the table.

If the value of TDMINn is greater than TDMAXn, or TLMINn is greater than TLMAXn, then the values of the pair of keywords *should* be interpreted as undefined. It is permissible to have values in a column that are less than TLMINn or greater than TLMAXn, however, the interpretation of any such out-of-range column elements is not defined.

The TLMINn and TLMAXn keywords are commonly used when constructing histograms of the data values in a column. This is particularly important when images or spectra are stored in “event list” format which tabulates the properties of each detected event. For example, X-ray missions may record images in a table that lists of the X and Y pixel location of each detected X-ray photon. Since such images may be quite sparse and many of the pixels may not contain any recorded events, the TLMINn and TLMAXn keywords provide information about the range of coordinates that could have been detected.

[Editorial note: Table C.2 will need to be updated to list these 4 keywords in the columns for ASCII and binary tables.]